CARNEGIE

Magazine

JUL 28 1949

FEEDING THE CHICKENS

"*We shall better know how to deal with them another time.*" General Braddock after his defeat at Turtle Creek.

Braddock's words represent the epitome of hindsight. The General, lately come from the battlefields of Europe, knew nothing of the tactics of backwoods fighting in America.

An individual inexperienced in estate administration often finds himself in a similar predicament when serving as executor of an estate. Regardless of previous success in his chosen business or profession, he is confronted with new problems and unfamiliar technicalities.

Therefore many persons, who wish to obtain the benefits of experience, name a trust institution as executor of their wills.

MELLON NATIONAL BANK
AND TRUST COMPANY
PITTSBURGH

Calendar of Events

CARNEGIE INSTITUTE

4400 Forbes Street, Pittsburgh 13, Pennsylvania
Mondays 10:00 A.M. to 10:00 P.M.
Other weekdays 10:00 A.M. to 5:00 P.M.
Sundays 2:00 to 6:00 P.M.
Cafeteria open for visitors to the building
Luncheon 12:15 to 2:00 P.M., weekdays
Refreshments 3:00 to 6:30 P.M., weekdays

CARNEGIE LIBRARY OF PITTSBURGH

Weekdays 9:00 A.M. to 9:00 P.M.
Reference services until 10:00 P.M., weekdays
Sundays 2:00 to 6:00 P.M., reference services only

Open to the public every day without charge

YOUNG ARTISTS

During July the Tam O'Shanters and their friends (ages ten to twelve) are meeting for outdoor sketching at the Institute on Tuesday and Thursday mornings at 10:00 o'clock. "Art in Nature" is the theme for the work this summer.

YOUNG NATURALISTS

Boys and girls interested in nature lore are coming to the Museum daily, Monday through Friday, July and August, for study of the out-of-doors. Fourth- and fifth-graders come at 10:00 A.M.; sixth- to eighth-graders, at 1:30 P.M.

YOUNG WRITERS

The J. P. Club for fourth- to ninth-graders who want to write poetry, stories, and radio scripts, and plays, meets each Tuesday through August at 2:30 P.M., in the Boys and Girls Room of the Library.

LITTLE EARS

Story hour for youngsters of all ages comes each Wednesday at 2:30 P.M., in the Library, during the two summer months.

THE YOUNG IN ART

Adult beginners in painting will continue to meet on Tuesday and Friday afternoons at 1:30 o'clock at the Institute through July 22. A fee of $6.00 is charged nonmembers of the Carnegie Institute Society.

FEEDING THE CHICKENS

The ivory carving by Okawa Shidzu Tami is one of many scenes from everyday Japanese life among the H. J. Heinz collection of ivories at Carnegie Museum. Very little can be learned about the artists who made these pieces. However, carvings of the Okawa School, toward the end of the last century, seem to be especially realistic and meticulous in detail and proportion.

The collection as a whole comprises more than a thousand carvings by Japanese, Chinese, European, and American artists. These range in style from conventionalized Chinese deities through the realistic Japanese and European genre types to the grotesquely amusing netsukes.

Because of space shortages it is impossible to display all at once, but selections from each of the groups may be seen in Room 7 and will be changed from time to time. This room, newly decorated in rich tones of blue and red, with modern individual-case lighting, also contains an exhibit from the DuPuy collection of objets d'art and silver. —D. B.

BEQUESTS—In making a will, money left to Carnegie Institute, Carnegie Institute of Technology, or Carnegie Library of Pittsburgh should be covered by the following phrase: I do hereby give and bequeath to (Carnegie Institute) or (Carnegie Institute of Technology) or (Carnegie Library of Pittsburgh) in the City of Pittsburgh, Pennsylvania.....Dollars

MEMORIALS—Carnegie Institute is prepared to receive contributions given by friends in memory of deceased persons in lieu of floral tribute, and to notify the deceased's family of such gift. The amount of the contribution will not be specified unless requested by the donor.

CARNEGIE MAGAZINE dedicated to literature, science, and art, is published monthly (except August and September) at 4400 Forbes Street, Pittsburgh 13, Pennsylvania, by Carnegie Institute, Carnegie Library, and Carnegie Institute of Technology. James M. Bovard, editor; Jeannette F. Seneff, editorial assistant; Florence A. Kemler, advertising manager. Telephone Mayflower 7300. Volume XXIII, Number 2. Permission to reprint articles will be granted on request. Copies regularly sent to members of Carnegie Institute Society. Subscription $2.00 a year. Single copies 25 cents.

MUSEUM EXHIBITS

Early Pittsburgh Glass—Rooms 1 and 2
Masks of the World—Room 4
Sea Bottom to Mountain Top—Room 5
Crystals and Jades—Room 6
Heinz and DuPuy Collections—Room 7

ART EXHIBITS

Permanent Collection of Oil Paintings
Galleries A, B, C, D.

LIBRARY

Memorial exhibit of rare books, prints, and indentures from the library of the late James M. Magee, sponsored by the Law Club of Pittsburgh. During July in the Library foyer.

MUSIC HALL

Community worship service, sponsored by twenty-six Protestant churches of the city, will be held on Sunday evenings at 8:00 o'clock. Outstanding visiting ministers will preach. The Welsh Singers conclude the series with a concert of sacred music the evening of August 28.

A GLIMPSE INTO AUTUMN

Tuesday, October 11

(*Opening the "Tuesday night at the Institute" season*)

BRIGANTINE YANKEE—Commander Irving Johnson. With colored moving pictures Commander Johnson will take the members of the Carnegie Institute Society with him on the colorful world cruise that he completed this past spring.

The cafeteria will be open for dinner from six to eight o'clock. Reservations should be made ahead of time.

The Guilds will have their first meeting of the season at 6:45 o'clock.

Thursday, October 13

Preview of Painting in the United States, 1949
for members of Carnegie Institute Society

Friday, October 14

Painting in the United States, 1949, opens.

Sunday, October 16

Films of Yesteryear begin.

INTOLERANCE

A film, produced in 1916 by D. W. Griffith, that shows the basis of modern cinema technique, will be the first in the series.

Wednesday, October 19

Founder's Day will be marked this year by open house for all friends of the Institute. At 8:00 P.M., there will be a short program of entertainment in the Music Hall. Afterwards the entire building—including the Fine Arts galleries, Museum laboratories as well as exhibits, the entire Library, and the printing department, bindery, photostat room, and other offices in the basement—will be open for inspection. Guides will assist visitors to the sections they particularly care to see.

Dr. Marshall Bidwell will be at the console of the great organ in Music Hall and will play during the evening, with the music amplified through the galleries.

Moving pictures will be shown in the Lecture Hall.

October 17 to 24

Pennsylvania Week

Arts and crafts exhibits and demonstrations

Exhibit by
Allegheny County Conference
on Community Development

CARNEGIE THEATER

Drama department summer session.

THE BEAUX' STRATAGEM
By George Farquhar
July 14, 15, 16, at 8:15 P.M.
Doors open to the public at 8:15 P.M.

KIND LADY
By Edward Chodorov
July 25, 26, 27 at 8:15 P.M.
Doors open to the public at 8:15 P.M.

A theater-in-the-round production to be given on the lawn, title announced later.
August 1, 2, 3 at 7:45 P.M.
The public is invited.

ART AND NATURE SHOP, Carnegie Institute

Attractive Wares · Moderate Prices

NEED NOTEPAPER?
Swiss flower prints
Dog portraits
Pennsylvania Dutch
Audubon prints

BESTOW BOOKS?
Mary E. Bakewell's *Of Long Ago*
Richard A. Wharton's *Mummies*
Marion Downer's *Discovering Design*
Huntington's *Let's Go to the Seashore*
Catherine T. Hammett's *Campcraft ABC's*

ADORE ART?
Oils and water colors
Brushes, palettes
Color reproductions
Booklets about artists

TAKE TOYS?
Plastic blocks and toy clock hands help to tell time and learn spelling.
Dolls from the Virgin Islands in native dress.

GATHER GADGETS?
Chinese enamel figurines
Rubber coasters, leaf design
Tiny glass vases
Enamel-on-copper ashtrays
Fossil minerals

A trust department created for women as well as men!

Fidelity's trust department, now located in our new building, is one of the first in this country particularly designed for the needs of women.

The customary and forbidding bronze and marble are missing from these new quarters. Instead, you'll find a warm, personal atmosphere; comfortable chairs, pleasing draperies and carpeting by Charles E. Beck & Co., decorators, and a striking mural of early Pittsburgh life by the artist-historian, Malcolm Parcell. The whole effect when you enter is that of coming into a well appointed living room.

We think it's something that should have been done long ago. Traditionally, the heads of families have always arranged their financial matters . . . handled investments, made the wills, set up the necessary trusts. But it has always been the families themselves—the wives, sisters and children —that look to a trust company for continuing help and guidance. So it has seemed to us that a trust company should provide the kind of service and setting that women most desire.

Long known for its specialization in trust business, Fidelity is happy now to offer this unusually gracious setting for its clients and friends.

* * *

Come in and see this pleasant way of doing business. And when your husband makes his long-range estate plans, ask him to check with Fidelity. We think he'll find it pleasant to deal with us, too.

Women are the beneficiaries of the greater portion of the $275 million in trust funds now administered by Fidelity.

Fidelity Trust Company

343 FOURTH AVENUE · PITTSBURGH

SUNLIGHT FOR ENERGY OF THE FUTURE

By Eugene Ayres

EUGENE AYRES

Our way of life is dependent upon an abundance of low-cost energy. We have been fortunate in the possession of great deposits of coal and oil, and in the technical genius of our people who have contrived to develop practical ways of utilizing the energy from the combustion of these fuels. It has been pointed out that more than three quarters of all the coal and 97 per cent of the petroleum produced during all past human history have been produced during the lives of most of those who read this article. The fossil-fuel era thus began only a few years ago, and it is interesting to speculate on the probable duration of the era, and on the nature of the succeeding era.

FOSSIL FUELS

The fossil fuels—coal and petroleum and natural gas—were formed many millions of years ago from carbon dioxide and water in living organisms by the influence of sunlight. Only a tiny proportion of the organisms resisted bacterial decomposition long enough to become buried deeply under sediments, and only a small proportion of the surviving residue was concentrated in locations from which it can be recovered. In these locations are our coal deposits and our oil and gas pools. New supplies of fossil fuels are forming now, but at a rate which should promise to renew our present supply long after the human race has disappeared. Thus we are confronted with the rather disturbing thought that in this fossil-fuel era we are going energetically about the earth hunting for materials that can be burned, and then burning up these materials at an ever increasing rate. It reminds us a little of the primitive Hindus who chopped down their trees for firewood without maintaining fertility of the soil.

APPALLING INDEFINITENESS

Until recently the problem of exhaustible sources of energy seemed to be too remote for serious consideration. We keep on finding more and more petroleum and gas, and there was believed to be enough coal in this country to last for thousands of years. But now we are not so sure. There are unmistakable signs that our rate of discovery of petroleum and natural gas has passed its peak, and a careful look at our statistics on coal resources shows an appalling indefiniteness. The more pessimistic view is that our total fuel resources, including coal, petroleum, gas, and oil from shale, will last us less than a century. The most optimistic view is that they will last less than four centuries.

These estimates take into account many factors such as: the probable size of the resource; the rate at which our use of energy is increasing; the efficiencies with which we convert energy into useful heat or power; the losses of energy in converting coal to electricity, and in converting coal to liquid or gaseous fuels. The last point is of particularly great importance and is related to the trends of preference for forms of energy, such as electricity and motor fuel. Estimates reaching into the future cannot be made without the benefit of many assumptions. Nevertheless the limits mentioned above—from one to four centuries—seem reasonable as things look today.

We have all been tempted to sit back comfortably in our easy chairs and wait for the nuclear scientists to develop cheap and abundant atomic power. The probability is that atomic power will be neither cheap nor abundant.

ATOMIC ENERGY?

According to present theories, the only elements that can yield net energy through nuclear fission under conditions that can be practically achieved on the earth are uranium and thorium. These elements are both abundant in concentrations too low for recovery. They are exceedingly scarce

in higher concentrations. At the present time most of the material used in this country is imported from limited deposits in foreign countries. It seems premature, therefore, to give any serious consideration to the use of atomic energy for the production in the future of our great requirements of heat and power. In the first place, we would be almost wholly dependent upon imports. In the second place, the world supplies which are now known to exist are relatively meager.

No one would be foolish enough to predict that our present theories may not change or that vast rich deposits of uranium and thorium may not be found, but there is no reason now to believe that our future energy demands can be satisfied in this way. It is safer to assume that they cannot.

Some sources of energy, such as fossil fuels and so-called atomic energy, are exhaustible. To use them may be compared with the spending of capital that earns no interest—like the killing of a goose which does not lay a golden egg. On the other hand, there are a number of continuous sources of energy, the use of which may be compared with the spending of income that cannot be otherwise invested.

CONTINUOUSLY FROM SUNLIGHT

Most of the continuous sources of energy are derived from sunlight—the agency which led, so many years ago, to the formation of our fossil fuels. A few of the ways in which sunlight can contribute to our supply of energy are as follows:

Vegetation can be burned as such or can be converted to alcohol or gasoline. Gasoline made from wood or other vegetation would cost only about half as much as alcohol from these sources. It is interesting to note that the world is now obtaining a tenth as much heat from the burning of wood as from the burning of coal. This use can be somewhat extended, but there are serious problems concerned with the supply of fresh water and the maintenance of fertility.

Hydroelectric installations recover some of the solar energy used to transfer water from the oceans to the atmosphere. About 3 per cent of the world's energy is now obtained in this way. The maximum hydroelectric power that is believed to be practically possible is about a quarter of the total energy the earth is now using. In the United States, about a quarter of our present installed electric power generation is hydroelectric. The limit for the future is several times what it is now, but it is estimated that this maximum in 1980 will be only about a fifth of what we will then require. The balance will come from coal plants.

The Claude process takes advantage of the difference in temperature between the surface and the depths of tropical waters. This is not being done now but is being planned by the French government. The maximum power from this source would be, perhaps, 0.1 per cent of the world's requirement.

Wind power can be developed from convection currents caused by solar radiation. This is kinetic energy—the kind that disappears entirely when you set up to get it all. The amount recovered now is trifling and will probably continue to be.

The heat-pump, which acts on the same principle as the ordinary household refrigerator, abstracts heat from coils buried beneath the frost-line or immersed in lake or deep-well water, and delivers it to radiators in buildings. This device is being used now to a limited extent, but the widest practical use of the heat-pump would reduce our national fuel requirement for space heating about 2 per cent.

CARNEGIE MAGAZINE is proud to present this article by Eugene Ayres, chief of the chemical division, Gulf Research & Development Company, to conclude this season's series on "The Sciences in Pittsburgh."

The suggestion for this series of articles was made by Dr. W. A. Hamor, assistant director of Mellon Institute of Industrial Research, and the choice of most of the authors, each of whom has been a distinguished local scientist, was made after consultation with Ellwood H. McClelland, who recently retired from direction of the Technology Department of the Carnegie Library of Pittsburgh.

Since his graduation from Swarthmore College in 1912, Mr. Ayres has been associated with the establishment of a score of new industrial enterprises. From 1924-29, in partnership with P. T. Sharples, he founded the Sharples Chemical Corporation for the manufacture of synthetic chemicals from petroleum. In 1929 he was put in charge of research for Gulf Refining Company and was transferred to Gulf Research & Development Company in 1934. Since that time he has been engaged in the organization and management of research concerned with the manufacture and sale of petroleum products.

TWO OTHER SOURCES

There are two sources of energy that do not depend upon the sun:

Tidal power results from the interference of continental shores on the flow of ocean tides. Some plants of this sort will probably be built, but the total power practically obtainable in this way would be only about 0.1 per cent of our total requirement.

The earth is radiating more heat than is absorbed by the sun because of radioactivity in the earth's interior. There is plenty of this heat but no way to use it except in the few volcanic installations.

THE ENERGY OF THE FUTURE

All the above continuous energy sources put together could not take care of our requirements. But we have a wonderful alternative in the more direct use of sunlight, which is so abundant that the small fraction of it that could, if necessary, be converted to usable heat and power, is hundreds of times what the earth will require in the foreseeable future. It seems that the major source of energy in the future will be sunlight.

There are many problems associated with the direct use of sunlight, and many of these problems are receiving active attention now by technologists.

Chemical engineers and architects are collaborating to develop houses which can be kept warm with little or no fuel combustion. The idea is quite close to economic reality, and you will hear much about it during the next decade.

The problem of getting high potential power from sunlight is more difficult. Dr. C. G. Abbot of the Smithsonian Institution did some pioneer work on optical concentration—a device that is actually being used to a limited extent in some parts of the world today. But the greatest hope for the future may come from progress in the development of higher efficiencies for thermocouples (which are used now for temperature measurement) and for photovoltaic cells (which are used now for light intensity measurement). These are both ways of converting sunlight directly into electric power. They are inefficient now, but there is no fundamental reason for low efficiency.

The future will show us the way to obtain from sunlight all the energy that we shall ever require.

A TUESDAY DATE

THE pleasant custom, "an evening at the Institute," took firm root last year in the hearts of a considerable number of Pittsburghers. A program of unusual interest has again been arranged for members of the Carnegie Institute Society by the Institute's Division of Education for this coming season, on Tuesday evenings—note the change from Monday—beginning with the night of October 11.

Nineteen illustrated talks are to be given at 8:15 o'clock in the Music Hall, a considerable number of these being the ever-popular travelogues with colored moving pictures. Interspersed in the series will be two discussions of the fall exhibit, Painting in the United States, 1949, by well informed art critics, and three concerts—one given by the Tech Student Symphony, one by the artists of the Carnegie Tech music faculty, and the third by the Pittsburgh Little Symphony, Victor Saudek conducting, sponsored by the Pittsburgh Musical Society, American Federation of Musicians.

The travel lecturers who will appear in the Tuesday-evening series include a number of the best-known names, and their subjects range far. Among them are Commander Irving Johnson, who will take his audience on a world cruise in the "Brigantine Yankee"; Robert Friars, speaking on "Belgium and Holland"; Edith Bane, who will tell of "India—Before and After Freedom"; Karl Robinson, speaking on Japan; Clifford Kamen, telling of Italy; Russel Aitken, taking his hearers on an "African Safari"; and Peter Koch, describing "Flame in the Brazilian Jungle."

Each Tuesday evening preceding the lecture series the various hobby Guilds sponsored by the Division of Education will meet at the Institute to follow up their particular interests. In addition to the Art and Nature Guilds inaugurated last season there are to be several more—crafts, home construction and design, drama, and music are all subjects that seem to be in the air. Some of these may be regularly scheduled for other times during the week, and not all on Tuesday evenings.

It will be possible on Tuesdays to have dinner from six to eight o'clock in the Institute cafeteria.

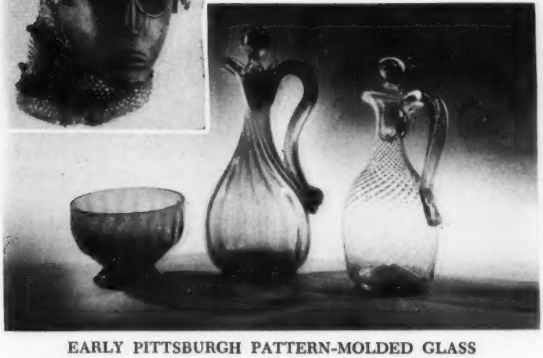
Let's Take A Walk Through The Institute

PORTRAIT OF THE ARTIST BY SIR WILLIAM ORPEN

SIBERIAN TIGER

GLASS MODEL OF PENICILLIUM

WEST-AFRICAN WITCH-DOCTOR MASK



EARLY PITTSBURGH PATTERN-MOLDED GLASS

MUSICAL WATCH FOBS (DUPUY)

PRESIDENT-ELECT OF CARNEGIE TECH

DR. JOHN CHRISTIAN WARNER, dean of graduate studies and head of the chemistry department, on June 9 was named president-elect of Carnegie Institute of Technology to succeed Dr. Robert E. Doherty upon his retirement on July 1, 1950. During the coming year Dr. Warner will work with Dr. Doherty in the newly created office of vice-president.

DR. J. C. WARNER

The appointment of Dr. Warner climaxes his twenty-three years of outstanding service at Carnegie. He joined the faculty as instructor in chemistry in 1926, after research work with Barrett Company, the Cosden Oil Company, and Wayne Chemicals Corporation, and an instructorship at Indiana University, from which he was graduated in 1919 and received his doctorate in 1923. At Carnegie he later became associate professor of theoretical chemistry and of metallurgical engineering. He did post-graduate work at the University of Michigan in 1933. In 1938 Dr. Warner became professor of chemistry and head of the department of chemistry, and when Carnegie planned a marked expansion of its graduate program in 1945 he was appointed dean of graduate studies of the College of Engineering and Science, two years later becoming assistant director of the College.

From 1943-45 Dr. Warner directed and co-ordinated research in the laboratories at the University of California and the University of Chicago, Iowa State College, Massachusetts Institute of Technology, and at Los Alamos, New Mexico, in highly confidential work on the purification of plutonium, a vital part of the development of the atomic bomb. He later participated in the operation of the Clinton Laboratories at Oak Ridge, Tennessee. He currently is a member of the Physical Science Advisory Committee to the Brookhaven National Laboratory and a consultant to the Argonne National Laboratory.

The president-elect is co-author of two widely used textbooks, *General Chemistry* and *Experimental General Chemistry*, and a laboratory workbook, *General Chemistry Problems*. He is also the editor and co-author of the fifth edition of Leighou's *Chemistry of Engineering Materials*, and the author of over fifty scientific and technical papers in the fields of physical chemistry and electrochemistry.

He was elected to Phi Beta Kappa, Sigma Xi, and Alphi Chi Sigma in his undergraduate years. Dr. Warner was recently elected vice-president and a member of the board of directors of the Electrochemical Society and, last year, one of three directors-at-large of the American Chemical Society. He has been councilor of the Society and chairman of its Pittsburgh section. He is a fellow of the New York Academy of Sciences and a member of the American Institute of Mining and Metallurgical Engineers. He is a founder-member of the Pennsylvania Chemical Society. Four years ago he received the award of the Pittsburgh section, American Chemical Society for "outstanding service to chemistry." The Pittsburgh section is one of the largest in the country.

Dr. Warner is married and has two

sons: William Hamer Warner, who is studying mathematics at Carnegie; and Thomas Payton Warner, a student at Shadyside Academy.

The appointment of a new president for Carnegie Tech had been under consideration since Dr. Doherty more than a year ago notified James M. Bovard, chairman of the board of trustees, of his intention to retire on his optional retirement date. A special committee of the Board of Trustees consulted with leading educators, heads of philanthropic foundations, and others interested in education before making its recommendation, which was unanimously accepted by the Board of Trustees.

Among Our Friends

THE library of Robert Donnell Book has been presented to the Carnegie Library of Pittsburgh by Mr. Book's children, Mrs. Barbara Book Cruikshank and Wilson Miller Book in memory of both their parents. The more than four hundred volumes will greatly enhance the Library's collection of early American history and travel. Some of the items are new in the Library, and others will replace copies in poor condition. A description of some of the material in this most interesting Americana will appear in a later issue of CARNEGIE MAGAZINE.

Mrs. Paul Offill has given $10 to the Carnegie Library School for books.

The endowment fund of Carnegie Institute of Technology has received a number of very generous gifts recently:

Charles E. Wilson, president of General Motors Corporation and a graduate of Carnegie Tech in 1919, presented $1,000 for the William R. Work Memorial Scholarship Fund. Paisley B. Harwood, class of '17, and Harold Erbing, '11, have each given $100 for the same fund.

H. Clifford Kreisle, Tech '23, has given $100 for general endowment, and from Thomas E. Orr, '17, has come $100 for the Engineering Scholarship Fund sponsored by by his class.

The Home Economics department of the Margaret Morrison Carnegie College has given $100 to the Jane Fales Memorial Scholarship Fund.

A NEW TRUSTEE

Parry

SIDNEY A. SWENSRUD

SIDNEY A. SWENSRUD, the president and director of Gulf Oil Corporation and subsidiary companies, on June 9 was elected to the board of trustees of Carnegie Institute and Carnegie Institute of Technology. Mr. Swensrud succeeds the late Dr. George H. Clapp on these boards.

Mr. Swensrud came to Gulf Oil Corporation in 1947 as director and executive vice-president after serving the Standard Oil Company (Ohio) in the same capacities. He had become associated with the Standard Oil Company as assistant to the president in 1928.

During World War II, Mr. Swensrud served with the Petroleum Industry committees on transportation, supply, and economics for district 2 and also on the economics subcommittee and postwar readjustment committee of the Petroleum Industry War Council. In addition, he was vice-chairman of the national refiners' advisory committee to the Office of Price Administration. He has written papers on various phases of the oil industry.

Mr. Swensrud is a director of the American Petroleum Institute and a member of the American Institute of Mining and Metallurgical Engineers. He is a director of the Pittsburgh branch of the Federal Reserve Bank of Cleveland.

A graduate of the University of Minnesota in 1923, he took his master's degree in business administration from the Harvard Graduate School of Business Administration four years later and stayed for a brief period as a member of the school staff.

CARNEGIE INSTITUTE SOCIETY

ANNUAL ASSOCIATE MEMBER	$10
ANNUAL SUPPORTING MEMBER	$15
ANNUAL CONTRIBUTING MEMBER	$25-100
ANNUAL SUSTAINING MEMBER	$100-1,000
ANNUAL SPONSOR	$1,000-5,000

THIS SUMMER AT THE MUSEUM

WALLACE RICHARDS

A "painting party," the 1949 equivalent of an old-time barn-raising, took place at Carnegie Museum on July 6, attended by scientists, executives, and trustees attired in their oldest slacks and, in some cases, no shirt at all. Amid considerable merriment, followed by sandwiches and beer, the men applied the first coat of paint to the walls of the Hall of Fossil Mammals. This was just another unprecedented move in the current program of redecorating, remodeling, and rearranging the Museum exhibition halls. The success of this "work party" has suggested subsequent ones to take care of the walls of the laboratories, behind the scenes, which have been needing paint for a long time. This activity, of course, is just supplementary to the work being done by the Institute's regular paint crew.

Visitors to the Museum are finding this process of re-doing, which is currently the major objective, quite as fascinating as a new exhibit. Moreover this summer they have the pleasure of watching Ottmar F. von Fuehrer at work, painting in turn four murals for various sections of Fossil Hall. One of these, 16′ x 12′ in size, will show a herd of mastodons; another, 28′ x 12′, flying reptiles or pterodactyls—these both on the first floor; a third, the same size, on the second floor, will depict the famous Rancho La Brea tar pit and struggling animals; the fourth is to be the 36-foot panel showing *Tyrannosaurus rex* in life-size restoration in native setting. Work on this fourth will doubtless not begin until autumn, but sketches for all four are on display at the base of each unpainted panel, and the work on the three smaller panels moves steadily ahead. Magdalena Loya and Hanne von Fuehrer will be working with Mr. von Fuehrer.

Two illustrated maps showing the mammal life of North America and of Africa, each 12 feet square, are also to be painted by Mr. von Fuehrer for the second-floor galleries.

Work will begin in the fall on a panoramic mural that is being designed this summer by Robert R. Young, between teaching his outdoor painting classes. This will be located on the newly constructed semicircular wall between the Carboniferous group and the Hall of Dinosaurs. It is planned to present a picture-chart showing the evolution of the earth and of animals, with symbols on the chart indicating where in the Museum may be found specimens of the particular phase of life development that is depicted.

Plans are also being worked out for the rearrangement and decoration of Bird and Reptile Halls. All these changes are being carried out under the supervision of Wallace Richards, director of the Museum.

The only one of the Museum staff who is doing extensive field work this summer is J. LeRoy Kay. Our curator of fossil vertebrates is continuing his project of a number of seasons, made possible by grants from the Childs Frick Corporation. Dr. Kay is studying and collecting specimens from the intermontane Tertiary sediments in northern Idaho, Montana, Washington, and into British Columbia. Dr. Kay is accompanied by his assistant, Louis A. Cattley, and by A. C. Lloyd, of the Museum's mammal section. The party will be in the field until October. A color map of this expedition, the work of Ottmar and Hanne von Fuehrer, may be seen on the wall at the entrance to the Museum.

M. GRAHAM NETTING

ARTHUR C. TWOMEY

M. Graham Netting, assistant Museum director, attended the annual meeting of the American Society of Ichthyologists and Herpetologists in Washington, D. C., June 19-21, reading a paper on "Methods of Snake Control." As president of the "Icks and Herps," as the organization is more familiarly known, Mr. Netting delivered an address on "Bursting at the Seams," a discussion of the problem of growing Museum collections. Earlier in the month he was in charge of the herpetological work on the annual outing of the Brooks Bird Club in West Virginia.

Arthur W. Henn, librarian and editor, attended the "Icks and Herps" convention as treasurer, and others present from the Museum staff were Grace L. Orton, of the section of amphibians and reptiles, and Mary E. Sumner, administrative assistant.

The American Society of Mammalogists, meeting also in Washington, was attended by J. Kenneth Doutt and Caroline A. Heppenstall.

The survey of Pennsylvania mammals being conducted under the direction of Dr. Doutt, curator of mammals, has progressed this month to the eastern part of the state. Some 4,000 specimens have been collected and catalogued from the northwestern part, 3,000 from the southwest, and collecting continues in the central section. Work on the specimens moves ahead in the laboratories under direction of Miss Heppenstall and John Guilday.

In the section of insects and spiders, the routine study of collections continues steadily: Walter R. Sweadner specializes on lepidoptera, and George E. Wallace, on the chalcid wasps. The study being carried out by Richard M. Fox on South American butterflies is nearing completion.

OTTMAR VON FUEHRER

LEROY K. HENRY

J. LEROY KAY

J. KENNETH DOUTT

Dr. Wallace is also sorting the insect parasites that have been collected in the course of the Mammal Survey.

LeRoy K. Henry, curator of plants, this summer has been investigating a number of bogs in the northwestern part of the state, especially in Erie County near Wattsburg, searching for orchids and other bog plants. He is also completing his collection of the violets of western Pennsylvania, and when the fungi season comes—in August and into the fall—Dr. Henry will be collecting fungi in this section of the state.

Harold J. Clement is finishing the second of ten cases of mammal family groups. This new group is sheep and oxen and includes ten miniature figures of the musk ox, mountain goat, the bison, and three species of wild sheep. Mr. Clement is also beginning a life-size restoration of the fossil vulture which, discovered in Wyoming, went on display at the Museum last year.

James L. Swauger, curator of the section of man, is making a survey this summer of all known information regarding Indian camp sites, burial grounds, and trails in southwestern New York State, western Pennsylvania, eastern Ohio, and the panhandle of West Virginia. Working with him is David W. Rial, under funds given by C. E. Cowan. The archeological interest of the Museum has been transferred from work done the past few summers in Utah and Nebraska, to a study of the Indians who lived in the Upper Ohio drainage basin. The research concerns the cultural archeology of the middle and late Woodland and the early Colonial periods. Information of this kind has been compiled in New York State, and is now being carried on by the state archeologist in the eastern and central portions of our own

Parry
HAROLD J. CLEMENT

JAMES L. SWAUGER

ARTHUR W. HENN

GEORGE E. WALLACE

state. In preparation for his work Mr. Swauger has studied the data collected by the American Philosophical Society.

The Heinz and DuPuy collections have been moved to Room 7 at the Museum and are displayed in a very effective setting that has been arranged under Mr. Swauger's direction. Deirdre Baird is studying, cleaning, and cataloguing the Heinz world-famous collection of ivories. Further in line with the modernization of all displays are the renovations and changes being made in Botany Hall.

O. E. Jennings is carrying through to completion his manuscript on the flora of western Pennsylvania and the Upper Ohio basin, for which nearly three hundred water-color plates have been painted by Andrey Avinoff. Publication of this joint work by the directors emeriti of Carnegie Museum is eagerly anticipated.

David M. Seaman, associate curator of minerals, has been granted a year's leave of absence to go to Cambridge, Massachusetts, where he will be associate curator of the Harvard Geological Museum and at the same time work for his doctorate in mineralogy at Harvard.

Gordon K. MacMillan, whose article on Pearls appears elsewhere in this issue, read a paper on "The Occurrence of *Hendersonia occulta* (Say) in Pennsylvania" before the fifteenth annual meeting of the American Malacological Union at the University of Miami, in Coral Gables, Florida, last month. The subject of his discussion is a land snail that has a sporadic distribution throughout eastern United States. At present it has been found in Pennsylvania only at eight localities in Allegheny and Greene Counties. Mr. MacMillan is writing his doctor's thesis on this subject and is constantly collecting specimens, whether in Florida or in Pennsylvania.

E. R. Eller, curator of invertebrate fossils, is prospecting in certain sections of this state and New York where new road cuts and quarries have exposed rocks from the geologic periods known as Upper Devonian and Mississipian. Dr. Eller is searching for fossils that will show the early development of the highly evolved insects, amphibians, and reptiles that are known to have existed in the later, the Pennsylvanian, period. Trails and tracks

(*Turn to page 53*)

Parry
ROBERT R. YOUNG

E. R. ELLER

O. E. JENNINGS

W. LEROY BLACK

EXHIBITS PLANNED FOR NEXT YEAR

PAINTING in the United States, 1949, the seventh in the series of contemporary American art shows since the suspension of the famous Carnegie Internationals in 1939, has been authorized by the Fine Arts Committee of the Institute, to open October 14, with a preview the evening of October 13.

The resumption of the International Exhibition of Contemporary Paintings at the Institute in the autumn of 1950 was announced in April. This, and the two succeeding annual International shows, have been guaranteed under a grant from the A. W. Mellon Educational and Charitable Trust.

This autumn's exhibit will continue a little longer than eight weeks, remaining through December 11. During the period of the show the galleries will be open daily from 10:00 A.M. to 10:00 P.M., and Sundays from 2:00 to 6:00 P.M. There will be three hundred paintings by the same number of American artists. All the pictures will be invited by the Institute, so there will be no jury of admission, but three artists will comprise the jury that will award the following prizes: First Prize, $1,500; Second Prize, $1,000; Third Prize, $700; and not more than three Honorable Mentions with no monetary prize. The jury of award will meet in Pittsburgh on September 16. The Fine Arts Committee has also provided for a Popular Prize of $200 to be awarded by vote of the gallery visitors during the two weeks of November 20 through December 4.

Homer Saint-Gaudens, director of the Department of Fine Arts, who is organizing the exhibition, has left on his annual pilgrimage in search of paintings for the show. He will visit the homes and studios of artists, the leading art galleries, and the important national exhibitions of paintings.

Arrangements for guided tours through Painting in the United States, 1949, without charge, may be made through Margaret M. Lee, of the Division of Education.

New exhibits planned by the Museum will continue along the spectacular trail already blazed this year. One of these will present the first public showing of the R. B. Mellon collection of fifteenth- and sixteenth-century wood carvings, numbering about 700 pieces. Contemporaneous fabrics owned by the Museum will be shown as background for the carvings.

Of especial interest to women will be a display of twenty-eight table settings, showing silver, glass, china, porcelain, and tablecloths. These materials will be brought from the West coast early in 1950 for exhibition under co-sponsorship of the *Pittsburgh Sun-Telegraph*.

Pennsylvania Week, October 17-24, will be marked at the Institute with evening demonstrations given by local artists and craftsmen, with music, folk and square dancing. Models of the various civic projects being carried out by the Allegheny County Conference on Community Development will be shown in the Institute foyer, and the work of members of the Arts and Crafts Center and of the Associated Artists of Pittsburgh will be displayed. Founder's Day will be observed the evening of October 19 with open house.

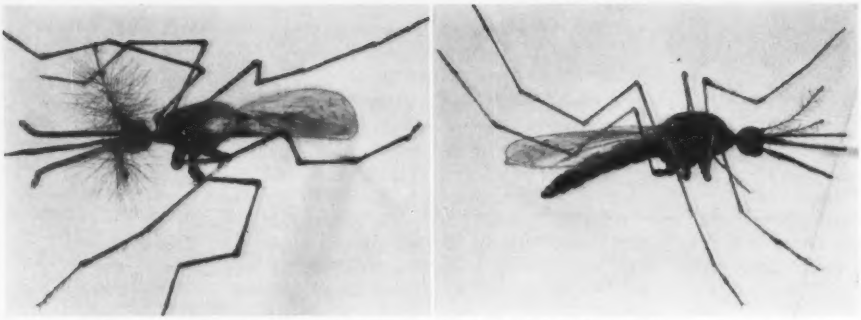
Books written, illustrated, printed, and bound by local men and women may be assembled for a fall showing tentatively planned under the joint sponsorship of the Carnegie Library and the Museum.

The fourteenth annual National Ceramics Show is scheduled to arrive at the Museum early in 1950. This will be the first out-of-town appearance of approximately 240 pieces comprising all the prizes and the best nonprize material from the exhibit in the Syracuse Museum this fall.

An exhibit of porcelain and china seems likely later in the year.

From Cranbrook Museum are to come on loan 27 panels telling the history of furs: how they are obtained, treated, and used.

Movie fans will be happy to learn that a series of some two dozen old-time movies is planned for Sunday evenings, to begin October 16. In addition to revivals of outstanding American and foreign films there will be special sequences showing the development of the dance, of motion pictures, of sculpture, and excerpts from the past successes of such stars as Douglas Fairbanks and Greta Garbo.



ANOPHELES PUNCTIPENNIS (FEMALE AT RIGHT) AS MODELED BY HANNE VON FUEHRER

"THE FEMALE OF THE SPECIES IS MORE DEADLY THAN THE MALE"

By Walter R. Sweadner

WALTER R. SWEADNER

Rudyard Kipling wrote, "The female of the species is more deadly than the male," but the sentiment may well have been expressed by Confucius, or even by a caveman. The phrase is often employed to lend a sinister note to a discussion of the activities of the mosquito, but this is an injustice, for the mosquito has no sinister intent. Among mosquitos the male is totally harmless, and the female is deadly only when she herself is ill. A healthy mosquito is merely a nuisance.

It is a whim of Nature that transforms the mosquito from a pest to an occasional menace, and at the same time a compensating whim prevents man from being exterminated by the diseases disseminated by this bloodthirsty fly.

Why should the female mosquito bite at all, since the male doesn't? The answer lies in the fact that the male does not lay eggs. A mosquito's eggs are quite large in proportion to her size, and to develop eggs requires proteins. A very convenient source of protein is blood, so the mosquito drinks blood. Disease germs live in blood. The germs of malaria, yellow fever, dengue, and many other diseases of man and of other animals are sucked up with blood when the mosquito drinks. Most germs are killed in the mosquito's stomach, but some germs are not killed by some mosquitos—and there the trouble starts. If the mosquito does not kill the germs, then they make the mosquito sick, and the ailing mosquito passes the sickness that it has gotten from one man on to a second man. Basically it is as simple as that. Fortunately Nature has made it much more complicated, and thereby saved the human race.

We have no spread of disease by mosquitos in Pittsburgh. Why? Nature has established barriers to such a spread, barriers that only a few combinations of circumstances can overcome. These circumstances combined to play an important role in the destruction of both the Roman and the Mayan empires and they cause great suffering and death in the world today. What prevents Pittsburgh from sharing the same fate?

Let us look at the local picture. The development of any one of the mosquito-borne diseases will serve. Suppose we take malaria, the greatest killer of them all. To have an outbreak of malaria we must have the right combination of at least four major factors:

First, there must be men who have the

disease, malaria, to make the mosquito sick. We have them—not many, but enough.

Second, there must be a kind of mosquito which gets sick. We have that, too. Of all the thousands of different kinds of mosquitos in the world, only those belonging to the Anopheles group become ill from human malaria. We have an Anopheles here. Its name is *Anopheles punctipennis*. My students regularly find its larvae in Panther Hollow Lake, and it can be found in suitable breeding places all over the country. No other local mosquito can get the disease, even if exposed to it.

Third, the mosquito must live long enough after it gets sick for the germs to enter its salivary glands. That depends on many factors. Climate is one, for warmth makes the mosquito develop faster and dryness shortens its life. The mosquito's own inherited resistance is another, for it may die of the disease or it may get well. In either of these cases it does not transmit the disease to a second man.

Fourth, the sick mosquito must bite a second man. It is this fourth factor that stops malaria in Pittsburgh. True, the climatic conditions are wrong and that helps; but it is a well-established fact that while *Anopheles punctipennis* can be induced to transmit malaria in the laboratory, she bites man only as a last resort, and only as an alternative to starvation. She has the same aversion to eating men as men have to eating rats. Dogs, cows, horses, and such are her preferred cafeterias. Even if she should get sick from biting one malaria patient and live through the incubation period, the chances that she would bite a second man are slim indeed.

Thus Pittsburgh has no malaria problem. It can be demonstrated similarly that the other mosquito-borne diseases have little chance here; accordingly, for us, the female is not more deadly than the male.

There still remains the pest aspect, however. The song of a mosquito can still keep one awake, and her bite still itches, even when we are assured that she is harmless. There is much that we can do to abate this nuisance. Spraying the air helps temporarily, but introduces another irritation and, in some cases, danger. It is better to stop the mosquito at its source.

Most, if not all, of our local non-anopheline mosquitos fall into two groups: the Culex that sings loudly, and the Aedes that whispers in one's ear. Both are "puddle" mosquitos, breeding in tin cans, clogged roof gutters, lily ponds, and such. Epidemic yellow fever, which is transmitted by an Aedes in the tropics, has been wiped out by destroying such breeding places. We can cut down the mosquito nuisance by doing likewise. If you do not want to become neighborhood Public Enemy No. 1, put plenty of small fish in your lily pond to eat the mosquito larvae, and drain your backyard swimming pool completely once a week.

Walter R. Sweadner is curator of entomology at the Carnegie Museum and assistant professor of biology at the University of Pittsburgh. A graduate of Carnegie Institute of Technology, he took his doctor of philosophy degree at the University of Pittsburgh.

AT THE MUSEUM

(*Continued from page 50*)

of these early forms of both invertebrate and vertebrate life have been found, but so far fossil remains are unknown.

The new Division of Education is carrying out a very extensive program this summer which includes many innovations, Arthur C. Twomey, the director of education, announces. W. LeRoy Black is directing nature study with Boy and Girl Scout leaders and troops and at nearby summer camps, among these being Camp Adelawan, Camp Pitt, Camp Hubbard, Camp Redwing, Camp Trefoil, the Sara Heinz Camp, and Camp Winnicut. A new plan to provide summertime nature recreation for city schools so requesting has gotten off to a good start. Boys and girls from Rogers School, Belmar, Frick, Fulton High, and Peabody High come one day each week during July and August for nature work in one of the city parks. A group of girls from the Juvenile Court spends each Friday in South Park for directed play. This work is being carried out by Robert Amon and Naomi Crow, part-time extension instructors at Carnegie Institute. Henry Spence has been assigned to the Traveling Trailside Museum which houses the Division's loan collection and will visit the various Girl Scout Day Camps, Pittsburgh Day Camp, and play-

(*Concluded on page 64*)

NATURE'S FINISHING TOUCHES

By O. E. Jennings

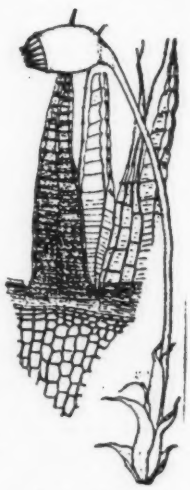
Mosses are among the finishing touches in Nature's decorative scheme. They mantle the fallen trunks of forest trees until these merge with the earth from which they came. They soften the angles of rocky slopes. From the Silvery Bryum between the bricks of the garden walk to the treeless wastes of the arctic tundra, they do their part in filling and beautifying Nature's niches. On limestone cliffs, in acid bogs, on bare soil, in dashing torrents, and in tropical treetops they abound. Most abundant in the moist tropics, they occur even in the desert lands of Arizona.

HYLOCOMIUM
Mountain Fern Moss

About fourteen thousand different kinds of mosses are now known, and many others are being discovered every year. Searching for mosses is like the sport of fishing, with surprises and disappointments and the anticipation of a good catch around the next rock. The *Manual of the Mosses of Western Pennsylvania*, published in 1913, described and illustrated 202 different kinds of mosses actually collected in the area.

Since that time 41 more have been discovered by myself and other, nonprofessional, botanists, mostly former students. Several have been discovered by C. M. Boardman, whose profession is in the field of electrical engineering. Only two weeks before the writing of this article, I took a few steps from an old lumber pile on Chestnut Ridge where I ate lunch and, to my surprise and keen delight, found the Long-necked Moss (Trematodon), which I had never before seen growing, and which had been found only once before in western Pennsylvania, about seventy years ago near Cresson on the Allegheny Mountain forty miles east of Chestnut Ridge. Such are the experiences that make the study of mosses in the field more interesting.

Not all so-called mosses merit the name. The Spanish Moss hanging in gray festoons from trees in Florida is not a moss; it is a unique member of the pineapple family bearing true flowers and seeds. The Reindeer Moss of the arctic tundra is a lichen, a combination of an alga and a fungus growing in mutual partnership; while the Club Moss is a member of the group to which the ferns belong.



Teeth and Capsule of Hylocomium

Moss plants originate from a microscopic spore which germinates to produce a usually green, threadlike growth called a protonema, which sometimes forms a green felt over the soil, such as the Hair Cap (Pogonatum) along moist clay roadside banks. This protonema in its turn mostly forms leafy stems which we ordinarily have in mind when we say "moss." These green leafy moss shoots bear minute primitive structures which in a general way correspond, respectively, to the stamens and carpels of flowers. From

the fertilized egg cell there develops the sporophyte stage, consisting of a spore-case usually borne on a slender stem, wherein form the minute spores.

Yes! Many mosses have teeth, but not for chewing. On old decayed logs or stumps, often on the cut end, we find Tetraphis, sometimes even in Pittsburgh parks, with four strong teeth at the mouth of the spore-case. On dry, shaley roadside banks grow the purplish, fluted capsules of Ceratodon with its 16 forked teeth; while on clay roadside banks the pale shaggy-hooded capsules of the Pogonatum have 32 teeth. The Pigeon-Wheat mosses, which form dark green patches and mounds on acid soils in old fields and moist open woodlands, have either 32 or 64 teeth. But the end is not yet.

CATHARINAEA
(Simple teeth)

Many mosses have thin segments, which might be called a second set of teeth inside the others, these sometimes with cilia or hairlike processes between them. These toothlike processes form a circle around the mouth of the capsule and collectively are known as the peristome, which literally means "around the mouth." The beauty of the latticelike symmetry of some peristomes, seen under a microscope, is exquisite! The peristome guards the opening of the capsule and, in many mosses, it is very sensitive to changes in moisture. On a dry day even the moisture of the breath will cause the peristome to quickly fold together, thus closing the mouth of the capsule. This means that the spores can escape from the capsule only when the air is dry and the wind can blow them far and wide.

PHYSCOMITRIUM
Urn Moss

Mosses like the Urn Moss (Physcomitrium), with erect capsules, often have no teeth at all, while those like the lovely Hylocomium, in which the capsules hang down, have the best developed peristomes, letting the spores sift out only when the air is dry. In the Peat Moss (Sphagnum) the capsule shrinks as it ripens, and on a hot dry day the pressure of the expanding air inside finally blows the lid off, releasing the spores in a miniature cloud. I once saw this happen in a sphagnum bog near Hartstown, Pennsylvania. Little puffs like smoke arose all around me in the hot morning sunshine.

One of the most unique mosses is Buxbaumia, the Bug-on-a-Stick Moss. This looks like a grain of wheat tilted up on the end of a little stick. Very particular about its habitat, it practically always grows on the sloping face of a clay bank along a wooded path or neglected country roadside, and is usually mingled with little whitish flecks of one of the Cladonia lichens. It takes a keen and observant eye to find it, and but few persons have been so fortunate. In the Pittsburgh region Mrs. Jennings was the first to find it—rather to my chagrin. Since that time, those who have discovered it independently are considered members of the unofficial Buxbaumia Club,

BUXBAUMIA
Bug-on-a-Stick

which has a membership at the present time of eleven. A number of years ago Sidney K. Eastwood, a structural engineer by profession, made a study of its occurrence in Butler County. He developed what seemed almost like an intuition as to where to look for it, and discovered it in twenty-one localities in that one county, thereby certainly establishing a world's record.

The peat mosses (sphagnums) constitute one of the most interesting groups of mosses. They occur abundantly in the more northern regions, where they form an important part of the tundra, and in lower Canada and the northern United States they form bogs around the margins of lakes and ponds or eventually fill them up with their partially decayed remains known as sphagnum peat, so largely used in some countries for fuel. In our own country this is used in large amounts by gardeners for loosening and making soil more retentive of moisture.

POLYTRICHUM
Pigeon-Wheat Moss

The leaves of the sphagnums consist of two kinds of microscopic cells: the one kind narrow and containing green chlorophyll, the other larger and empty with usually spiral fibers, to keep them from collapsing, and with pores in the walls. These larger, porose cells take up water like a sponge, and there have been instances in which sphagnum bogs in shallow depressions have taken up so much water that they have burst, causing disastrous floods down the valley below.

Another unique feature of sphagnum is that it is more or less antiseptic, so that, as it grows upward, the lower parts do not readily decay away, but remain, and the bog deposits may thus accumulate to a depth of many feet. Due to the antiseptic qualities of sphagnum, logs buried centuries ago are often found well preserved in sphagnum bogs. The body of a woman dressed in haircloth garments centuries old was found under eleven feet of peat in Ireland.

SPHAGNUM
Peat Moss

Because of the unique antiseptic and water-absorptive qualities of sphagnum, it is largely used by nurserymen to pack around shipments of nursery stock. Years ago it was known by the Hudson Bay Company that wounds dressed with sphagnum bandages would remain moist two or three times as long as with other bandages. During the latter days of World War I there developed a serious shortage of absorbent cotton, and attention was directed to the superior qualities of sphagnum for surgical pads. Bryologists pointed out that certain species of sphagnum would absorb by dry weight about three times as much water as would absorbent cotton. Sphagnum surgical pads hold the water longer, they are cooler, and more or less antiseptic. Guided by bryologists in locating and in the selection of the species, the

Red Cross organizations of Scotland, Canada, and the northernmost United States were organized to supply many tens of millions of sphagnum surgical pads for the year 1918, had the war continued. The British were already using them at the rate of a million a month. Although there is no longer the necessity for using sphagnum for pads in place of absorbent cotton, the fact still remains that in some particulars sphagnum is superior.

Mosses soften the face of Nature; they help hold the soil in place and permit the rain to soak down to replenish our sinking water-table; some, like the sphagnums, are of direct economic value; they hold an important place in the science of botany; and their study can be a hobby providing interesting and educational recreation.

Dr. O. E. Jennings has just completed the revision of his *Manual of the Mosses of Western Pennsylvania* (1913), which will appear in print in a few months. It will contain 3,010 illustrations similar to those appearing here, drawn by the author.

He is the author of a large number of other standard botanical works, and from 1913-38 was editor of the *Bryologist*, then the only journal devoted to mosses, hepatics, and lichens.

Dr. Jennings joined the staff of Carnegie Museum, of which he is now director emeritus, in 1904, in 1915 became curator of botany; fifteen years later he added the duties of director of education, then from 1946-48 was director of the Museum. He also served as head of the departments of botany and biology at the University of Pittsburgh.

He is president of the Botanical Society of Western Pennsylvania and of the Academy of Science and Art of Pittsburgh.

At the National Council of State Garden Clubs meeting in Portland, Oregon, last month, a certificate was awarded to Dr. Jennings in recognition of his meritorious service in ecology.

FIRST EDITIONS

The memory of James M. Magee, lawyer, soldier, congressman, and bibliophile, is honored in an exhibition of books and prints from his collection on view in the foyer of Carnegie Library this month. The display is sponsored by the Law Club of Pittsburgh, of which he was one of the founders.

Mr. Magee's library included some very fine bindings and many first editions. Charles Dickens' *Little Dorrit* is of interest, for example, because it appears in the pamphlet form typical of his early editions. There are also a number of books illustrated by famous English artists of the nineteenth century, such as Kate Greenaway, John Leech, and George Cruikshank. A few limited editions from some of the noted presses are shown.

Among the prints are illustrations for *Don Quixote* by Henry Alken, a very famous sporting artist of his day. Amusing prints by Cruikshank offer a penetrating commentary on the life and customs of the nineteenth century.

The exhibit includes indentures from the reigns of Charles II, William and Mary, Queen Anne, and George I. An indenture is a deed to which two or more persons are parties. Historically the word refers to a deed that was cut from its counterpart in a wavy line. The portions of the document could be fitted together in case of argument.

IN MEMORIAM

J. FREDERIC BYERS

J. Frederic Byers, member of the boards of trustees of Carnegie Library of Pittsburgh, Carnegie Institute, and Carnegie Institute of Technology, passed away on Saturday, June 12.

Mr. Byers, a native Pittsburgher, was a graduate of St. Paul's School, Concord, New Hampshire, and of Yale University. He was elected a trustee of the Carnegie institutions in Pittsburgh on June 2, 1932.

During the period of his trusteeship he was, from time to time, a member of a number of committees of the various boards, but his chief service was rendered as a member of the Fine Arts Committee of Carnegie Institute—a position he held for more than fifteen years. His knowledge of art, which was inherent in him and which he had developed to an unusual degree over the course of acquiring an outstanding private collection of oil paintings—a knowledge coupled with a sound and discriminating judgment—made him one of the Fine Arts Committee's most valuable members. It will be difficult to fill his place.

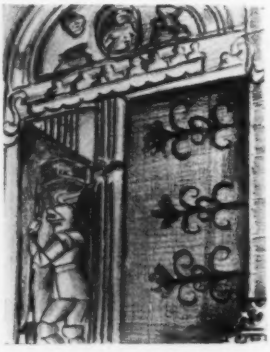
RICHARD JENKINS (Age 12)

PAULA TAYLOR (12)

DONALD BRYAN (12)

A FEW SKETCHES BY THE TAM O'SHANTERS

BARBARA WILLIAMS (12)



ALLAN LUEDY (12)

CHARLOTTE WALLY (12)

FLORENCE GEASA (11)

LORENE BLASCHE (11)

DAVID GIBSON (11)

WHAT'S GOING ON HERE

A few figures reflecting the activity at Carnegie Institute and Carnegie Library of Pittsburgh, June 1, 1948 to June 1, 1949

Carnegie Institute Society membership.....2,096

Visitors.....1,266,803
- Galleries, Library..... 878,075
- Music Hall..... 197,194
- Lecture Hall..... 191,534

Broadcasts.....71

Fine Arts

Exhibitions.....11
- Painting in the United States, 1948
- Current American Prints, 1948
- Collection of Fine Prints (Gift of Kenneth Seaver)
- Steuben Glass with Original Engraving Drawings by Contemporary Artists
- Associated Artists of Pittsburgh (39th Annual)
- Masterpieces from the Berlin Museums
- Pittsburgh Salon of Photographic Art (36th Annual)
- Paintings, Drawings, and Prints of Pittsburgh, 1790-1949
- National High School Art presented by Scholastic Magazines
- Lithographs by Benton Spruance
- Contemporary Drawings from Carnegie Institute Collection

Prize moneys awarded.....$3,700

Paintings received as gifts.....1

Prints, drawings, water colors received as gifts.....132

Art objects sold from various exhibits..32

Cash value of sales.....$9,622

Paintings lent for outside exhibit.....5

Sculpture lent for outside exhibit.....4

Art lectures.....5
Attendance 2,800

Museum

Exhibits.....9
- Community Activities—Pennsylvania Week
- Crystals and Jades
- Early Glass of the Pittsburgh District
- Edwards Silver
- Heinz and DuPuy Collections
- Masks of the World
- Porcelain and Pottery
- Sea Bottom to Mountain Top

Education

Carnegie Institute Society Monday-evening lectures.....16
Attendance 13,416

Films of Yesteryear series (double showings).....11
Saturday attendance 22,000
Sunday attendance 15,400

Field trips.....2
Attendance 185

Special classes (Advertising Artists of Pittsburgh).....9
Attendance 202

Guild of Artists sessions.....27
Attendance 889

Guild of Naturalists sessions.....27
Attendance 623

Tours conducted through fall exhibit .167
Attendance 7,936

Adult groups conducted through Fine Arts.....45
Attendance 4,889

Children conducted through Fine Arts.....23,237
18,310 of these sponsored by Board of Public Education

Children conducted through Museum.....32,256
16,447 of these sponsored by Board of Public Education

Sessions of drawing and painting classes for children.....106
Attendance 34,895

Sessions of children's science clubs.....44
Attendance 975

Saturday motion-picture programs for children.....24
Attendance 6,020

Loans of natural-history visual-aid cases through Board of Public Education.....5,884
368 portable cases containing 4,278 specimens on permanent loan to the Board, scheduled through the public schools; viewed by 200,987 students.

Loans of natural-history visual-aid cases to clubs, groups, and other schools.....126
808 study skins, 371 portable cases containing 2,378 specimens, available; viewed by 67,657 persons.

Music Hall

Organ recitals 64
Attendance 28,281
972 compositions performed, representing work of 252 composers, of whom 87 are American.

Organ compositions given first performance in Pittsburgh 39

Musical organizations participating 35
Twelfth Christmas Carol Festival included 22 nationality choirs.

Library

Volumes in book collection 1,186,569
Adult 908,338
Juvenile 278,231

Borrowers registered 24,091

Books circulated 2,889,261
Central 463,283
Branches 1,312,814
Schools 1,113,164

Reference questions asked 52,625
Reference Room 18,397
Pennsylvania Room 5,131
Art Division 6,160
Music Division 5,953
Periodical Division 1,625
Technology Department . . 15,359

Photostats sold 28,716

Pictures lent 15,453

Music Division:
Records circulated 8,339
Records played in Division 11,059
7,703 listeners

Library for the Blind:
Active readers registered 1,054
Books in Braille circulated 5,801
Talking books circulated 23,607
Ceiling projectors 41
13 at hospitals
Books on film for projectors 522

Boys and Girls Department: (Central and Branches)
Story-hour attendance 77,017
1,690 sessions
Attendance at book talks 41,318
855 groups
Contacts in school visits 12,112
478 visits
Pictures circulated 85,984

PAINTINGS LENT

Three paintings from the permanent collection of Carnegie Institute have been lent to art galleries for exhibit outside of Pittsburgh within the past few months.

George Inness' *The Clouded Sun* went to Washington, D. C., for the De Gustibus Exhibition from January 7 to February 20.

The Old King by Georges Rouault was lent to The Century Association for the exhibition of Masterpieces of Post-Impressionist Art, from February 5 to April 1, in New York City.

The Toledo Museum of Art borrowed *The Great Bridge at Rouen* by Camille Pissarro for an exhibition of paintings and drawings by that artist which ran from May 8 to June 5.

CAROLYN DIMMICK (13)

RONALD SHEA (14)

FROM THE PALETTE PAINTING CLASS

DONALD BARACCA (13)

PATRICIA RENKAWEK (13)

CAROL HEUBER (14)

WILLIAM MALCOLM (12)

WHY THE PEARL IS OF GREAT PRICE

By Gordon K. MacMillan

Parry
G. K. MACMILLAN

The earliest mention of pearls comes from China, for in 2350 B.C., it was recorded that an emperor received a string of pearls as tribute.

By the fourth and third centuries before Christ, pearl fisheries had been established in Ceylon, Persia, India, and China.

The pearl was also known to the ancient Egyptians, a string of half pearls having been found in the tomb of King Ah-hopte.

The pearl has long been an object of commerce and, because of its peculiar beauty and splendor, has held a high place among precious stones during all ages with both civilized and barbarous peoples.

In concluding his Sermon on the Mount, Jesus Christ forbade the apostles to cast their "pearls before swine." Theologians believe that Jesus meant that one should not expose the sacred truth and mysteries of the gospel to the raillery of profane libertines and hardened atheists. In His many parables, Christ compared heaven to many things, one of these being a pearl: "Again, the kingdom of heaven is like unto a merchant man, seeking goodly pearls; who, when he had found one pearl of great price, went and sold all he had, and bought it."

These two references and many others in the Bible on the use of pearls as adornment indicate that this jewel was especially esteemed and familiar in Asia Minor and other sections of the Orient. The biblical pearls came from Bahrein in the Persian Gulf, the Red Sea, and also from the island of Kis, which lies upon the borders of Arabia. The state of Israel, being not far from these places, received these precious gems through the normal channels of commerce existing at that time in that particular region.

BRILLIANT SARCOPHAGUS

A pearl itself consists of carbonate of lime interstratified with animal membrane arranged in concentric layers. It is formed by the deposition of nacreous substance, or mother-of-pearl, secreted periodically during the warm season by the pearl oyster around some foreign body within the thickened mantle lobes. The presence of a minute grain of sand, a small piece of shell, the eggs of parasitic worms or sharks, or even a copepod, a small crustaceanlike animal, in the fleshy parts of the animal, particularly within and around the adductor muscle, will be sufficient to set up an irritation so that this nacreous substance, the same as the lining of the shell, is secreted. As the pearl increases in size as the result of additional layers deposited on the outside, further irritation is produced, resulting in continued secretion of the mother-of-pearl to lessen injury to its tender flesh. The pearl formed around the parasitic worm has aptly been called by a French scientist "only the brilliant sarcophagus of a worm."

Occasionally a foreign object becomes lodged between the shell itself and the mantle, and, when covered by the nacre, it is firmly cemented to the shell, becoming a "blister pearl." If this type of pearl is well raised above the shell it can be cut out and set in a ring or brooch where perfect roundness is not required as it is for necklaces.

It seems that the best and most perfect of the natural pearls are produced by animals

---

Gordon K. MacMillan, who is associate curator of invertebrates at Carnegie Museum, has been connected with the Museum for twenty years, this period interrupted only by a year of graduate work in the department of entomology at the University of Illinois and eighteen months of service with the United States Army.

Mr. MacMillan graduated from the University of Pittsburgh in 1930, took his master of science in zoology seven years later, and at present is finishing the thesis for his doctorate at the University.

He has written considerably on the land snails of northeastern United States, his special field of study.

CULTURED PEARL IN OYSTER

that are not perfectly healthy. Overcrowding causes the formation not only of pearls, but also nodules and secretions. When the pearl-producing shell is large, well formed, and with ample space for individual development, pearls are scarcely produced, but when the shells are crowded together and become humped and distorted, affording cover for all kinds of marine worms and parasitic creatures, then pearls will most likely be found.

MANY FATHOMS DOWN

Pearls may be found in almost any kind of an aquatic shell but have little commercial value since the interior surface of these shells is not brilliantly lustrous or highly colored. Genuine precious pearls are produced by the pearl oyster, known scientifically as *Pteria margaritifera* (Linnaeus), which lives in tropical seas growing singly or in clusters on coral reefs and rocks fifteen to twenty fathoms down. It is a bivalve shell related to *Pecten* or the scallop shell. Another source of pearls of value are the fresh-water mussels or clams of our rivers and ponds. While pearls may occur in any of the many species of these shells, they are more often found in the heavier-shelled varieties. The few pearls taken from the thin-walled species are usually small and of no great value.

White pearls are the most valuable, outranking yellow, green, pink, and gray ones, which, however, are held in high esteem when two or more are perfectly matched. Black pearls are very valuable because they are uncommon. Globular pearls, free from flaws or discoloration, bring the highest price; pear-shaped pearls rank next in value. Perfect pearls increase in price in geometric ratio with increased weight and size.

Sometimes pearls contain a few spots or blemishes on their outer surface. These flaws are removed by skinning the pearl with a small three-edged file. One skin at a time is delicately and carefully cut. Slowly the pearl is peeled until a whole, flawless skin is left, and then the pearl is ready for a buyer.

The beliefs of the ancients as to the origin of pearls are very interesting. It was thought that when a drop of rain fell into a mollusk on St. John's Eve it was changed into a pearl. Others saw in it a symbol of sorrow, the pearl being a tear of God. The effect of a flash of lightning was another interpretation of the origin of this gem. Again, it was the distillation of the tears of the Nereids, nymphs attendant on Poseidon.

By the thirteenth century A.D., the Buddhists in China had discovered a novel use for the mollusks that secreted the pearl substance. Small lead figures of the seated Buddha or figures stamped in tin were inserted in the shell between the mantle and the inner layer. After seven years these Buddhas had become covered with the mother-of-pearl and were then sold as religious symbols.

CULTURED BLISTER PEARL

Both pearls shown are in Carnegie Museum collection.

Kokochi Mikimoto, a present-day Japanese, discovered in the early years of this century the process by which a whole pearl could be cultivated in the body of the pearl oyster. The rediscovery of this process was obtained through the knowledge that a nacre-secreting mollusk will cover small objects with a pearly coat. Pearls were thus made available to many instead of a few, as the tide and temperature of the waters of Japan, combined with the very cheap cost of labor, made it possible to produce the cultured pearl profitably on a large scale. The cultured pearl is produced by the same process as the natural pearl, but in this case the irritating and foreign object is deliberately inserted by man instead of by a chance entrance under natural conditions.

The finest Japanese pearls are developed by the strongest oysters obtained by careful breeding and repeated examination for diseases during their growth. The oyster spawn is collected, and when old enough the young oysters, or spats, are placed in fine meshed cages to protect them from the attacks of starfish, octopi, or other enemies, and then lowered into the sea. Cleaning the cages is a necessity to insure the oyster freedom from disease. At the age of two the oysters are transferred into wider-meshed trays and returned to the sea.

When the pearl oyster has reached maturity, usually at the age of three years, the development of the cultured pearl is begun. The shell of an oyster is removed by an expert shell "doctor," who places a small portion of mother-of-pearl on the outside of the secreting layer of cells, the epithelium, of the mantle. The epithelium is then cut and drawn over the nucleus to form a sac, the neck of which is then tied. This sac is then grafted into the subepidermal tissue of a second oyster, and the binding removed. After the wound has been treated with an astringent, the second pearl oyster is placed in a cage holding about a hundred and fifty mollusks, lowered into the sea, where it will remain about seven years before being harvested. Approximately 60 per cent of the oysters operated upon yield pearls, but owing to the irregularity in shape as a result of uncontrolled factors in their development, only about 5 per cent are of marketable value.

From all outward appearances it is very difficult to distinguish the cultured pearl from the natural pearl. Even expert jewelers cannot readily distinguish the one from the other. However, the differences of the interior structure or arrangement of the concentric layers and the type of nucleus or core around which the pearl is formed in each can be ascertained by X-ray examination.

The gourmet who likes his oysters fried, scalloped, or as Oyster Rockefeller, need not be overjoyed upon finding a pearl in his fare. Pearls found under such conditions have been ruined by cooking, as they are exceedingly sensitive to heat. Thus this apparent great find, bringing with it visions of wealth, must fade away into nothingness with the vapor and aroma of epicurean delight.

AT THE MUSEUM

(Continued from page 53)

grounds throughout the city. In addition, this outdoor staff will work hand-in-hand with the nature recreation program of the City Department of Parks and Recreation in Frick, Schenley, and Riverview Parks, where underprivileged children spend a full week of day-camping during the two summer months.

The children's art class sponsored by the Division of Education, numbering two hundred, meets under the direction of Margaret M. Lee, with Amelia Wheeler as instructor, each Tuesday and Thursday morning this month for sketching out of doors, and Jane A. White is in charge of the Junior Naturalists, a small group of fourth- to eighth-graders, who come for nature study outdoors five days of the week through the summer months with Grace E. Klinzing as instructor. Robert R. Young conducts the adult painting class, in which some thirty persons are enrolled for lessons and painting each Tuesday and Friday afternoon during July.

It is anticipated that nearly 50,000 individuals will be reached to some extent, at least, by the activities of the Division of Education of Carnegie Institute this summer. The greatly expanded educational program is made possible by the recent grant from the Howard Heinz Endowment.

AUGUST STILL LIFE—Wray Manning, American, 1941—*Cleveland Museum of Art*

FAMILIAR FOODS IN FAMOUS PAINTINGS

▶ Here is the essence of midsummer—a blaze of harvest color massed against a weathered clapboard wall. Plumb-ripe tomatoes, their shiny cheeks stretched taut with crimson juice . . . portly eggplant in a plum colored mantle . . . bold cucumber blades . . . tawny-hued squash . . . amethystine grapes and striped green melon . . . pinks and mums in a bushel basket.

▶ This sun-dappled scene affords enduring pleasure to the eye and promises a world of satisfaction to the palate. But a second glance reveals the irony in this summer idyl. For these simple, essential things by which man lives—food and beauty—are heaped satirically on a crumpled paper bearing the news that turned our era topsy-turvy.

▶ It is characteristic of this sentient and sensitive artist, in the face of mounting crises, to find beauty in the common things at hand. At a time of heightened public tensions, Manning, like many thoughtful people, sought stability within. And there he found the reservoirs of strength, tranquility, and inner grace so readily sensed in "August Still Life."

▶ Subtle as its theme are the gentle hues with which this canvas is awash—muted greys, soft blues, and tender greens united firmly by the horizontal red brick wall. Thin pigment laid on with the free fluidity of water color . . . bold outlines . . . plastic roundness of vegetable forms . . . a pleasing quality of texture contrast . . . and an abbreviated style that says much in a few calligraphic strokes—all these combine to make a personalized, serenely satisfying picture.

▶ It takes the ordered mind, the seeing eye, the compassionate heart, the trained hand to paint such a pleasing still-life picture of food. But it is within the province of every imaginative homemaker to produce her own delightful scenes—day-in, day-out—on the dinner table. With 57 Varieties of choice prepared foods to lend their color and flavor magic to her meals, the American homemaker is indeed a culinary artist—the creator of real-life masterpieces.

—Heinz School Service Library

57 H. J. HEINZ COMPANY 57

THE PLAY'S THE THING

A Review by Austin Wright

Head, Department of English, Carnegie Institute of Technology

The department of drama rang down the curtain on the 1948-49 season in the Carnegie Theater with a double bill comprising *Antigone*, a modernized version by Jean Anouilh of the Sophoclean tragedy, and Shaw's *The Showing-up of Blanco Posnet*. Both plays were directed by A. Nicholas Vardac, associate professor of drama at Stanford University and director of the Stanford Players.

This *Antigone* is the play that won such renown when it was produced in Paris in 1943 under the nose of the Nazi conqueror. Further adapted by Lewis Galantiere, it served as a Broadway vehicle for Katharine Cornell and Cedric Hardwicke in 1946, and this adaptation was followed at Carnegie. One assumes that the Galantiere adaptation differs markedly from the version written by Anouilh, for it contains such explicit defiance of tyranny that the Nazis would hardly have permitted its performance uncut.

A POWERFUL TRAGEDY

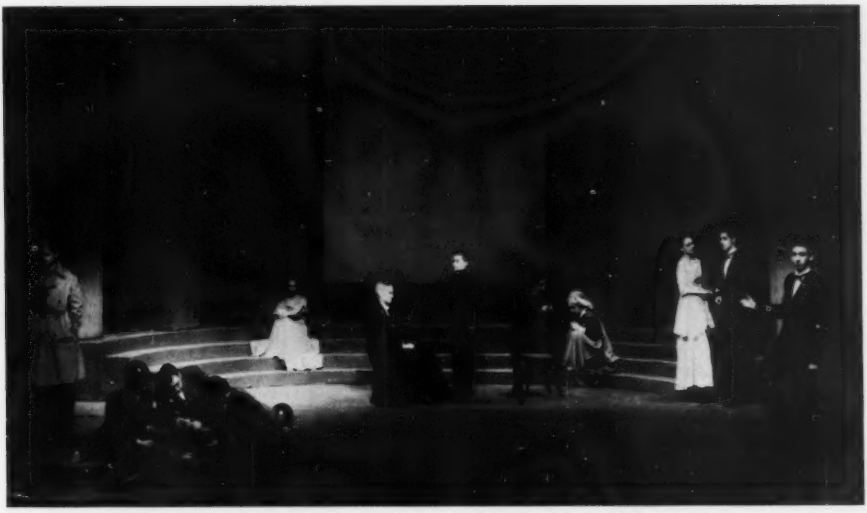
Antigone was played without an intermission, and reports that reached me concerning the opening night, for which I was unable to be present, led me to expect a tedious performance. On the contrary, when I saw the opening show of the second cast I came as close to genuine exaltation as I have been in any theater in some time. True, the length of the play constitutes something of an ordeal when it is staged without interruption—the second cast played it in one hour and forty-two minutes, and the first cast required ten minutes more—but the play itself is so powerful and the performance was so splendid that the time did not seem long.

The outline of the plot is basically the same as in Sophocles, and the familiar characters are all present. Antigone dies because she places the laws of God above the laws of man: she tries to bury the dishonored body of her brother Polyneices and thus deliberately flouts the edict of her uncle, Creon the king. But in the Anouilh-Galantiere adaptation the dialogue is modern colloquial speech, the characters wear modern dress, the Chorus is a suave, cigarette-smoking commentator in evening jacket, and the guards are card-playing, grousing soldiers in what look like GI uniforms.

CREON'S PLAY

The play belongs to four persons—Creon, Antigone, the Chorus, and the First Guard. And in particular it belongs to Creon. These four roles were acted with extra-

CAST OF DRAMA-SCHOOL STUDENTS IN SHAW'S "THE SHOWING UP OF BLANCO POSNET"



JEAN ANOUILH'S "ANTIGONE" PRODUCED IN MODERN MANNER AT THE CARNEGIE THEATER

ordinary skill in the performance which I saw given by the second cast. The performance of the first cast which I attended a few evenings later seemed a little less polished and less "inspired," if I may use that word, though it too was highly effective. The noble setting conceived by Lloyd Weninger, the superb lighting designed by Charles Larkin, and the effective use of movement and pause by the director gave to the production an eerie grandeur and a solemn sense of timelessness.

The most memorable of the many powerful scenes is that in which the intelligent, subtle, resourceful Creon tries to dissuade Antigone from what he describes to her as a purposeless and foolish act of martyrdom.

SECOND-RATE SHAW

There is something to be said for the theory that second-rate Shaw is better than first-rate almost-everybody-else. *The Showing-up of Blanco Posnet* seldom sounds like the work of the man who wrote *Man and Superman* and *St. Joan*, but it is a lively, amusing sketch which Mr. Vardac and the student actors played for all it is worth.

The irreverent attitude toward God voiced by the swaggering Blanco and Mr. Shaw's good-natured contempt for the sniveling Elder Daniels seemed to the British authorities sufficient reason for banning this play forty years ago, but today the work is chiefly interesting for its Shavian conception of life in an American mining camp in the not-so-old West. Blanco Posnet—how in the world did Mr. Shaw come to think of that dreadful name?—revels in wickedness and blasphemy until he is betrayed by his better nature into doing a kind act at the risk of his life. Arrested as a horse thief and threatened with summary hanging, he is less fearful of the noose than of being shown up as a soft-hearted booby. Righteousness triumphs, after a fashion, but there is doubt whether Blanco or anyone else in town will be the better for the experience longer than it takes a determined man to get drunk.

There were engaging performances in the roles of Blanco and Elder Daniels, and that audacious but likable trollop Feemy Evans was played with uproarious success in both casts, but in a very real sense Mr. Shaw has given top billing in the play to Sheriff Kemp—and the Sheriff was portrayed with an earthy vigor and a hearty humor that could hardly have been bettered.

As for Mr. Shaw's conception of Western speech, it reminds me of a Wild-West sketch that I once saw in a Piccadilly Circus music hall, when a painfully British cowboy in sombrero and chaps swaggered into a saloon and remarked to the bartender, "I say, old thing, I'm dying for a drink and I've only got fo'-pence."

THE SCIENTIST'S BOOKSHELF

By M. Graham Netting
Assistant Director, Carnegie Museum

PREHISTORIC MEN By Robert J. Braidwood. Chicago: Chicago Natural History Museum. 1948. 117 p., illustrated. $.50, (plus $.07 postage).

Museums are constantly besieged with requests for popular publications upon a wide variety of subjects. Our visitors would like booklets profusely illustrated, preferably in color, at the moderate prices they are accustomed to paying for paper-covered trade books. Museum staffs have the knowledge and skills to prepare such needed and educationally useful publications. Without promotional budgets, however, few museums can hope to market large enough editions to illustrate them adequately and still offer them at prices attractive to students and visitors.

We could, I suppose, band together to sponsor "Mastodon Munchies—the Mammoth Breakfast Food" and offer a pamphlet for only 25 cents and one box top, but I reject this solution because consumption of new breakfast foods to enable children to obtain some prize is already one of the lesser joys of parenthood. The only practical solution to this problem that I can see is for museums to co-operate by selling each other's publications and thereby enlarge the market for each title. In pursuance of this policy Carnegie Institute's Art and Nature Shop is endeavoring to make available in Pittsburgh some of the outstanding nontechnical publications of other American museums.

MAN THE MOST INTERESTING

There is scientific basis as well as emotional bias for the contention that man is the most interesting animal even though one of the most recently evolved. I use "recently" in its geological sense, for man is at least half a million years old. Braidwood summarizes the long period of prehistory and the brief time of history in an apt manner that makes the span of half a million years more comprehensible: "If we were to compare this whole length of time to one day, we'd get something like this: The present time is midnight, and Jesus was born just five minutes and thirty-six seconds ago. Earliest history began less than fifteen minutes ago. Everything before 11:45 was in prehistoric time."

Many a layman interested in man's past —and quite a past it is—has lost enthusiasm because the writings of anthropologists were scholarly rather than slangy. In every profession, from baseball to medicine, it is easier to write in the jargon or argot of the trade than to express the same thoughts in simple phrases of the mother tongue. In his preface, the author of *Prehistoric Men* confesses that the writing of learned papers had not prepared him for the difficulty of expressing himself in simple fashion. The fact that he succeeded in doing so is the paramount reason why I have chosen this booklet for review. It is small enough to be crammed into any vacationer's suitcase, entertaining enough to enliven the rainy hours that plague most holiday seekers, and simple enough to be read by every member of the family from Scout age upward.

LIKE CLASSIFYING AUTOMOBILES

Another stumbling block in the path of amateur anthropologists is the multiplicity of classifications of the peoples of the world. Many a beginner hardly learns one system before he comes upon another, devised by an equally erudite writer, that is quite at variance with the first. By the time he encounters a third classification he is hopelessly confused and is apt to give up in disgust, berating the scientists for not getting together. In every field of science classifications are necessary frameworks, which cannot be established by fiat, nor stabilized until detailed knowledge replaces working hypotheses. I have never seen the difficulties of classification better

explained than in this booklet. "Suppose you try to make a classification of automobiles," the author writes. "You have first to decide what should count most heavily in your classification. Shall it be the make, or the body color, or the number of cylinders, or the horsepower, or the number of people the car can carry? After you decide on the detail that is to be the most important in your classification, you'll have to decide on the next most important, and so on. I imagine you won't decide that the body color is very important!"

Braidwood does not, however, carry this analogy far enough to indicate the extreme difficulty of the physical anthropologist's task. Although you might find the preparation of a logical classification of automobiles somewhat time-consuming, the job could be done with reasonable completeness since all varieties of automobiles are still extant or descriptions of them are available. Human remains are so scanty, however, that the anthropologist's problem is comparable to that of a student 100,000 years hence who might endeavor to classify automobiles on the basis of fragments found in a "graveyard" near Détroit, a half-dozen spark plugs from England, a carburetor and broken wheel from South Africa, and odd parts dug up in a dozen scattered localities. In view of the magnitude of the problem it is remarkable indeed that so much has been learned of man's origins.

Men differ from other animals in the ability to use tools. Even though you are not very handy around the house and your wife may cast aspersions upon your use of a hammer, there is no doubt that you can hold it better than a bear could, and you have a much better idea of how it should be used than any monkey. Fundamentally your brain is a tool, also, and you can always point out that it has fashioned more tools than the hand has ever wielded.

Early tools are the very lifeblood of archeology, for many of them were fashioned from almost indestructible flint. A major portion of this booklet is devoted to primitive tools. This section is well illustrated and the artist, Susan T. Richert, has in most instances accompanied the drawing of the tool with a sketch of its modern counterpart. Thus, for example, the use of a burin or graver is readily apparent when sketched in conjunction with a modern chisel.

DRAMA IN THREE ACTS

Braidwood divides the human drama into three acts of vastly different length. The first act, The Food-Collectors, began with the making of simple tools a half million years or more ago, on the broad stage of the Old World. The players had simple roles, living off the country in small wandering bands and using fire, caves, and primitive weapons for protection. There were stars in this act, for the cave paintings of southern France and northwestern Spain, executed twenty to thirty thousand years ago, constitute "one of the great artistic achievements of all time."

The second act, The Food-Producers, began about ten thousand years ago, on the center stage of the Near East. The players adopted new and diversified roles—domesticating and herding animals, domesticating and planting grains, making pottery and weaving textiles. Within five thousand years the second act reached the climax of "civilization," practically synonymous with urbanization. At this point the historian replaces the archeologist as the critic of the continuing drama.

The third act, The Industrialization, began only a short while ago. The author wisely refrains from detailing this act, but he does remark: "If the pace of the second act was so much faster than that of the first, the pace of the third act is terrific. The danger is that it may wear down the players completely."

I remarked earlier that it was difficult for museums to produce attractively illustrated booklets at a moderate price for a limited market. The Chicago Natural History Museum, with a well-patronized bookshop, has succeeded in issuing a lengthy series of popular publications on anthropology, botany, and zoology, to which *Prehistoric Men* is an admirable addition. It is my hope that Carnegie Museum may emulate this good example with booklets as attractive, authentic, and readable.

The series of line drawings that have accompanied Mr. Netting's book reviews this year have been the work of Dorothy E. Long, assistant, section of plants.

It began

about 5000 years ago

Glass-making, we mean. There's a pale green cylinder of glass in the University of Chicago that they think dates from 3000 B.C.

So we like to think that our business began then, too. And that today, by manufacturing quality glass products for you to use in an infinite variety of ways, we are creating a fine new tradition for a very ancient art.

The Pittsburgh Plate Glass Company also specializes, however, in producing some of the most *modern* materials our civilization knows . . . materials peculiarly characteristic of the mid-twentieth century.

In Paints . . . the name "Pittsburgh," and the technology of Color Dynamics, are outstanding in the field.

In Chemicals . . . Pittsburgh Plate Glass Company is an important factor.

And in Plastics . . . the newest of them all . . . Pittsburgh Plate Glass Company has already won an important place.

When you need any of these products . . . glass, paint, chemicals or plastics . . . and wish to be sure of quality, we suggest that you use the "Pittsburgh" name as your buying guide.

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

BOARD OF TRUSTEES

Under the charters the same thirty-six trustees serve both Carnegie Institute and Carnegie Institute of Technology, and eighteen of them (starred) are also trustees of Carnegie Library of Pittsburgh.

EDWARD DUFF BALKEN
Princeton. Art.

JAMES H. BEAL
Princeton. University of Pittsburgh Law School. Reed, Smith, Shaw & McClay. Fine Arts.

FREDERICK G. BLACKBURN
Yale. Carnegie Institute of Technology. Vice President, Mellon National Bank and Trust Company. Museum, Tech, Auditing, Advisory.

WALTER J. BLENKO
Carnegie Institute of Technology. Duquesne University Law School. Blenko, Hoopes, Leonard & Glenn. Chairman, Executive Committee, Carnegie Institute of Technology.

*JAMES M. BOVARD
Yale. University of Pittsburgh Law School. President, Carnegie Library, Carnegie Institute; Chairman of the Board, Carnegie Institute of Technology.

*ARTHUR E. BRAUN
Chairman, Farmers Deposit National Bank. Buildings and Grounds, Finance, Advisory.

*SAMUEL B. CASEY
Babson Institute. Vice President, John F. Casey Company. Buildings and Grounds.

*WALTER R. DEMMLER
City Council. Library, Museum, Tech.

*J. ROY DICKIE
Washington and Jefferson. University of Pittsburgh Law School. President, Board of Public Education. Library.

ROBERT E. DOHERTY
University of Illinois. President, Carnegie Institute of Technology. Tech, Art.

*JOHN T. DUFF, JR.
University of Pittsburgh Law School. City Council. Museum.

HOWARD N. EAVENSON
Swarthmore. Mining Engineer. Museum, Pension, Tech, Art, Advisory.

*THOMAS J. GALLAGHER
City Council. Buildings and Grounds.

H. J. HEINZ II
Yale. President, H. J. Heinz Company. Museum, Pension.

ROY A. HUNT
Yale. President, Aluminum Company of America. Art, Tech, Finance, Advisory.

*THOMAS E. KILGALLEN
Duquesne University. President, City Council. Music Hall.

JOHN F. LABOON
Carnegie Institute of Technology. Consulting Engineer. Chairman of the Board, Allegheny County Sanitary Authority. Tech, Music Hall.

*DAVID L. LAWRENCE
Mayor of Pittsburgh. Art.

*EDWARD J. LEONARD
City Council. Music Hall, Pension.

RICHARD K. MELLON
Princeton. Chairman of the Board, Mellon National Bank and Trust Company. Museum, Advisory.

*W. L. MELLON
Chester Military Academy. Museum.

*WILLIAM S. MOORHEAD
Yale. University of Pittsburgh Law School. Moorhead & Knox. Tech, Library, Art, Auditing.

AUGUSTUS K. OLIVER
Yale. Vice-President, Commerce Building Company. Pension, Tech, Advisory.

*THOMAS L. ORR
Hamilton. Vice President, Mellon National Bank and Trust Company. Art, Tech, Finance, Advisory.

JOHN LESTER PERRY
Assistant to the President, United States Steel Corporation. Music Hall.

JAMES C. REA
Princeton. Vice President, Oliver Iron and Steel Corporation. Museum, Music Hall, Pension, Finance.

*WILLIAM M. ROBINSON
Princeton. University of Pittsburgh Law School. Reed, Smith, Shaw & McClay. Finance.

CHARLES J. ROSENBLOOM
Yale. President, Rosenbloom Finance Corporation. Art.

FREDERIC SCHAEFER
University of Pittsburgh. President, Schaefer Equipment Company. Museum, Art.

*WILLIAM WATSON SMITH
Princeton. Smith, Buchanan & Ingersoll. Art, Advisory.

SIDNEY A. SWENSRUD
University of Minnesota. Harvard Graduate School of Business Administration. President, Gulf Oil Corporation.

*FREDERIC G. WEIR
Princeton. University of Pittsburgh Law School. City Council. Buildings and Grounds, Advisory.

WILLIAM P. WITHEROW
Yale. President, Blaw-Knox Company. Music Hall, Tech, Advisory.

*A. L. WOLK
Columbia University. University of Pittsburgh Law School. City Council. Auditing, Library, Advisory.

LAWRENCE C. WOODS, JR.
Princeton. Manager, Woods Agency, Equitable Life Assurance Society of United States. Museum.

CARNEGIE INSTITUTE PRESS

The high spot of every visit to Pittsburgh

Have you ever seen Pittsburgh *all at once?* It's a wonderful sight that has impressed thousands of visitors to the City.

Here, on the Gulf Building Promenade, four hundred eighty feet above the street, you'll get a view you'll long remember . .

Of a city of rivers and bridges, its famous Golden Triangle, its industries, its hills and homes —over a radius of ten miles.

The Gulf Building Promenade is open every week day from nine in the morning until four-thirty in the afternoon. There is no admission charge.

THE GULF BUILDING
SEVENTH AVE. & GRANT ST.
PITTSBURGH